

**Amendments to the Drawings:**

Please replace the original drawings, sheets 1-14 depicting Figs. 1-18, with the attached sheets 1-13 depicting the same Figs. 1-18. Attached sheets 1/13-5/13 depict Figs. 1-7 in the exact same arrangement as presented in original sheets 1/14-5/14, and, therefore, replacement sheets 1/13-5/13 have been identified as "Replacement Sheet" in their top margins. Replacement sheet 6/13 depicts Figs. 8(a)-(d) and Fig. 9 which Figures were originally depicted on original sheets 6/14 and 7/14. Replacement sheet 6/13 therefore is a combination of original sheet 6/14 and original sheet 7/14. Replacement sheets 7/13-13/13 depict Figs. 10(a)-18 in the exact same arrangement as presented in original sheets 8/14-14/14, respectively. Replacement sheets 6/13-13/13 have been identified as "New Sheet" in their top margins since while the Figs. correspond to the original Figs. the sheet numbers differ from the original sheet numbers.

**REMARKS**

In response to an earlier restriction requirement, applicant elected claims 1-37, 39-50 and 52-70 for present examination. Additionally, the Office Action also withdrew claims 42, 46, 68 and 69 from consideration. Applicant respectfully requests reconsideration of such withdrawal in view of the accompanying amendments. The present Office Action has set forth a number of objections and rejections to the pending application and claims. By the present Amendment, applicant has endeavoured to address each of the points set forth in the Office Action and place the application and claims in condition for allowance.

Turning, sequentially, to the issues raised by the Office Action, and in response to the earlier objection to the drawings under 37 CFR 1.83(a), applicant has herewith submitted a set of replacement drawings.

The Office Action identified a number of perceived informalities with the claims. Applicant appreciates the suggestions provided in the Office Action for correcting the informalities. Applicant has endeavoured to amend the claims to obviate the objections. In that regard, applicant has amended claims 52, 53, 61-66 and 70 in accordance with the suggestions outlined in paragraphs 8-13 of the Office Action. Claim 52 also has been amended to include a source of radiation in response to the objection raised in paragraph 15.

Paragraph 16 of the Office Action rejected claims 64-68 under Section 112, first paragraph, because of the perception that the specification does not disclose radiation being received from the cable. Applicant respectfully disagrees with this perception. In the embodiments of claims 64-68, the optical radiation emitted by the emitter is received from the cable by virtue of reflection. Thus, while the radiation is not emitted by the cable, the radiation is received from the cable as stated in claim 64.

Applicant has amended the claims to resolve the objections in paragraphs 18-24 of the Office Action. Paragraph 35 of the Office Action stated that the “and/or” limitation of claim 52, line 9 was indefinite. Applicant has amended and, essentially together with new claim 72, split claim 52 into two claims to cover the alternatives covered by the and/or statement. Hence, new claim 72 covers the second alternative.

Applicant has amended the claims to resolve the objection in paragraphs 26-29. Paragraph 30 of the Office Action raises a similar issue to claim 64 as was raised by Paragraph 16. As noted above, radiation is received from the cable by virtue of reflection. However, in order to clarify that the radiation is not the same radiation as emitted by the applicator, applicant has re-defined the radiation (used by the sensor to determine the speed) as the “second radiation”.

Paragraph 31 of the Office Action identifies issues with two aspects of claim 70. First the Office Action indicates an issue with “the polling interval” in line 1. However, this language is not present in claim 70. The Office Action also indicates that “the rate of rotation” in line 5 does not have an antecedent basis. Applicant has amended “the rate of rotation” to “a rate of rotation” to address this point.

Paragraph 33 of the Office Action rejected claims 52-70 because claim 52 is a system (apparatus) claim and it included a “calculating” limitation that was perceived as a method limitation. Applicant has amended “calculating” to “calculate” in claim 52 to clarify that the “control unit is configured to calculate ....” The Federal Circuit has expressly held that apparatus claims are not necessarily indefinite for using functional language. *See, for example, Microprocessor Enhancement Corp. v. Texas Instruments, Inc.*, 520 F.3d 1367, 1375, 86 U.S.P.Q.2d 1225 (Fed. Cir. 2008) (apparatus claim “limited to a pipelined processor possessing the recited structure and *capable* of performing the recited functions” is not indefinite) (emphasis

in original). Here, the system claim is clearly limited to the recited structure which includes a control unit capable of performing certain recited functions. Thus, claim 52 does not cover both an apparatus and a method of use of that apparatus and it is not indefinite.

Paragraphs 34-63 of the Office Action address prior art objections. First, in order to more clearly define the invention, applicant has amended claim 39 to include the features of claim 40 and a feature from claim 41. Each of the prior art rejections rely on Cronin (WO 00/49957) in combination with other references. As discussed below, the applicator and radiation emission pattern of Cronin (WO 00/49957) is quite distinct from applicant's presently claimed inventions and none of the other references remedy this distinction and deficiency with respect to applicant's claimed inventions.

Applicant's claims are directed to apparatus for treating varicose veins. Varicose veins are veins which have become enlarged and torturous. Blood flows in the reverse direction through such veins and it is desirable to completely close varicose veins to stop the flow altogether. For this reason, the varicose veins are generally removed surgically or are shrunk down to a closed condition by applying radiation from an external source. Applicant realized that such enlarged veins could be treated by microwaves emitted radially from an internal application. However, a problem of this is that the vein only constricts under the application of microwaves and hence the vein will constrict onto a cylindrical applicator with the applicator thereby preventing full closure of the vein. In that regard, WO00/49957 (Cronin) discloses an application having a hemispherical end, which is adapted to direct radiation in a generally forward direction only onto a cervix. There is no radiation in the radial direction. The hemispherical end is blunt and is unsuitable for insertion into a vein. The device of Cronin only emits radiation in the forward (axial) direction and hence is unsuitable for treating varicose veins

because it does not radiate radially hence the forwards radiation would not be incident on the enlarged walls of the vein at all.

Applicant has solved this problem by providing a tapered for tip on the applicator, the applicator emitting radiation radially from both its mid section and the tapered tip. Initially, the tapered tip provides the advantage that it allows the applicator to be pushed along the vein, the tapering portion serving to gently widen the unattached parts of the vein to allow the applicator to pass therethrough. Once the area to be treated has been passed, microwave energy is applied to the applicator via the cable and the cable is pulled slowly out of the vein at a controlled rate, with the tapered tip of the applicator forming the trailing edge. The vein initially constricts onto the wider leading mid section of the applicator under the application of microwaves. However, since the radiation is also emitted from the tapering tip portion, the vein further constricts onto the tapering portion under the application of microwaves, with the cross-sectional area of the tip getting less and less the more the applicator is pulled passed a particular point to be treated. In this manner the vein can advantageously be fully closed under the application of microwaves.

The present invention therefore recognizes the problem of treating varicose veins using an internal microwave applicator and solves the problem by providing a tapering tip, which emits the microwave radiation radially to allow the veins to be fully closed. As stated previously, Cronin (WO 00/49957) only emits radiation in an axial forward direction of the applicator. This reference does not disclose that the field is radiated radially and thus the device would be wholly unsuitable for treating varicose veins internally. The hemispherical end of Cronin WO 00/49957 is solely shaped that way to provide reflection surfaces that cause the microwave to be emitted in the axial direction. The shaped end is not stated as providing any function apart from an electrical one and thus a person skilled in the art would not consider this document at all designing an apparatus to treat varicose veins. For the above reasons, applicant respectfully

submits that the inventions defined by claim 39 and the companion pending claims are clearly distinguished over the cited Cronin document alone or in combination with the other references. For example, the Office Action rejects claim 41 (from which some features are now present in amended claim 39) as obvious over Cronin in view of Taylor (4,534,347). Taylor discloses a microwave applicator comprising a scalpel blade, in which a microwave field is generated in the immediate vicinity of the tip of the scalpel. Both Cronin and Taylor lie in completely different fields from the present invention, which is directed to applicators for treating varicose veins. Accordingly, a person skilled in the art would not consider the teachings of either document when searching for a solution for the above-mentioned problem. In fact, the device of Taylor is wholly unsuitable for the treatment of varicose veins due to the fact that it is a scalpel, which cannot be inserted into a vein for obvious reasons.


In view of the foregoing, applicant respectfully requests the issuance of a timely Notice of Allowance.

The Commissioner is authorized to charge any fees or deficiencies or credit any overpayments to Eugene M. Cummings, P.C., Deposit Account No. 50-4199 with reference to attorney docket number (0934-0048).

Respectfully submitted,

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